

IN THE CLAIMS:

1. (Currently Amended) A method, comprising:
forming a process layer;
forming an ARC layer above said process layer;
determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer;
determining, based upon said determined at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer, at least one parameter of a stepper exposure process; and
performing said stepper exposure process comprised of said determined at least one parameter on at least one wafer.
2. (Original) The method of claim 1, wherein forming a process layer comprises depositing a process layer.
3. (Original) The method of claim 1, wherein forming a process layer comprises forming a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.
4. (Original) The method of claim 1, wherein forming an ARC layer above said process layer comprises depositing an ARC layer above said process layer.

5. (Original) The method of claim 1, wherein forming an ARC layer above said process layer comprises forming an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer.

6. (Currently Amended) The method of claim 1, wherein determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer comprises measuring at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer.

7. (Currently Amended) The method of claim 1, wherein determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer comprises determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

8. (Currently Amended) The method of claim 1, wherein determining, based upon said determined ~~optical characteristic~~ at least one of an index of refraction and an extinction coefficient of said ARC layer, at least one parameter of a stepper exposure process comprises determining, based upon said determined optical characteristic of said ARC layer, at least one of an exposure dose and a focus of a stepper exposure process.

9. (Currently Amended) The method of claim 1, ~~wherein further comprising determining at least one optical characteristic of said ARC layer comprises determining at least one of a reflectivity, an index of refraction, and an extinction coefficient of said ARC layer.~~

10. (Currently Amended) A method, comprising:
depositing a process layer;
depositing an ARC layer above said process layer;
measuring at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer;
determining, based upon said measured at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer, at least one parameter of a stepper exposure process; and
performing said stepper exposure process, comprised of said determined at least one parameter, on at least one wafer.

11. (Original) The method of claim 10, wherein depositing a process layer comprises depositing a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

12. (Original) The method of claim 10, wherein depositing an ARC layer above said process layer comprises depositing an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer.

13. (Currently Amended) The method of claim 10, wherein measuring at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of said ARC layer comprises determining at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

14. (Currently Amended) The method of claim 10, wherein determining, based upon said measured at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of said ARC layer, at least one parameter of a stepper exposure process comprises determining, based upon said measured at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of said ARC layer, at least one of an exposure dose and a focus of a stepper exposure process.

15. (Currently Amended) The method of claim 10, ~~wherein further comprising measuring at least one optical characteristic of said ARC layer comprises measuring at least one of a reflectivity, an index of refraction, and an extinction coefficient~~ of said ARC layer.

16. (Currently Amended) A method, comprising:
depositing a process layer;
depositing an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer;
measuring at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of said ARC layer;

determining, based upon said measured at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layer, at least one parameter comprised of at least one of an exposure dose and a focus of a stepper exposure process; and
performing said stepper exposure process, comprised of said determined at least one parameter, on at least one wafer.

17. (Original) The method of claim 16, wherein depositing a process layer comprises depositing a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

18. (Original) The method of claim 16, wherein measuring at least one optical characteristic of said ARC layer comprises determining at least one optical characteristic of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

19. (Original) The method of claim 16, wherein measuring at least one optical characteristic of said ARC layer comprises measuring at least one of a reflectivity, an index of refraction, and an extinction coefficient of said ARC layer.

20. (Currently Amended) A method, comprising:
forming a process layer above each of a plurality of wafers;
forming an ARC layer above each of said process layers;

determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of each of said ARC layers;

determining, based upon said determined at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layers, at least one parameter of a stepper exposure process; and

performing said stepper exposure process, comprised of said determined at least one parameter, on at least one wafer.

21. (Original) The method of claim 20, wherein forming a process layer comprises depositing a process layer.

22. (Original) The method of claim 20, wherein forming a process layer comprises forming a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

23. (Original) The method of claim 20, wherein forming an ARC layer above each of said process layers comprises depositing an ARC layer above each of said process layers.

24. (Original) The method of claim 20, wherein forming an ARC layer above each of said process layers comprises forming an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above each of said process layers.

25. (Currently Amended) The method of claim 20, wherein determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of each of said ARC

layers comprises measuring at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of each of said ARC layers.

26. (Currently Amended) The method of claim 20, wherein determining at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of each of said ARC layers comprises determining at least one ~~optical characteristic of an index of refraction and an extinction coefficient~~ of each of said ARC layers by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

27. (Currently Amended) The method of claim 20, wherein determining, based upon said determined ~~optical characteristic~~ at least one of an index of refraction and an extinction coefficient of said ARC layers, at least one parameter of a stepper exposure process comprises determining, based upon said determined ~~optical characteristic~~ at least one of an index of refraction and an extinction coefficient of said ARC layers, at least one of an exposure dose and a focus of a stepper exposure process.

28. (Currently Amended) The method of claim 20, ~~wherein further comprising determining at least one optical characteristic of each of said ARC layers comprises determining at least one of a reflectivity, an index of refraction, and an extinction coefficient~~ of each of said ARC layers.

29. (Currently Amended) The method of claim 20, wherein determining at least one ~~optical characteristic~~ of an index of refraction and an extinction coefficient of said ARC layers comprises averaging a plurality of optical measurements of said ARC layers.

30.-41. (Canceled)

42. (New) The method of claim 1, further comprising performing said stepper exposure process, comprised of said determined at least one parameter, on at least one additional wafer.

43. (New) The method of claim 10, further comprising performing said stepper exposure process, comprised of said determined at least one parameter, on at least one additional wafer.

44. (New) The method of claim 16, further comprising performing said stepper exposure process, comprised of said determined at least one parameter, on at least one additional wafer.

45. (New) The method of claim 20, further comprising performing said stepper exposure process, comprised of said determined at least one parameter, on at least one additional wafer.

46. (New) A method, comprising:

forming a process layer above a first wafer;

forming an ARC layer above said process layer;

determining at least one optical characteristic of said ARC layer;

determining, based upon said determined at least one optical characteristic of said ARC

layer, at least one parameter of a stepper exposure process; and

performing said stepper exposure process, comprised of said determined at least one

parameter, on at least one wafer other than said first wafer.

47. (New) The method of claim 46, wherein forming a process layer comprises depositing a process layer.

48. (New) The method of claim 46, wherein forming a process layer comprises forming a process layer comprised of at least one of polysilicon, a metal and silicon dioxide.

49. (New) The method of claim 46, wherein forming an ARC layer above said process layer comprises depositing an ARC layer above said process layer.

50. (New) The method of claim 46, wherein forming an ARC layer above said process layer comprises forming an ARC layer comprised of at least one of silicon nitride, silicon oxynitride, silicon dioxide and titanium nitride above said process layer.

51. (New) The method of claim 46, wherein determining at least one optical characteristic of said ARC layer comprises measuring at least one optical characteristic of said ARC layer.

52. (New) The method of claim 46, wherein determining at least one optical characteristic of said ARC layer comprises determining at least one optical characteristic of said ARC layer by using at least one of a scatterometer, a reflectometer and a spectroscopic ellipsometer.

53. (New) The method of claim 46, wherein determining, based upon said determined optical characteristic of said ARC layer, at least one parameter of a stepper exposure process comprises determining, based upon said determined optical characteristic of said ARC layer, at least one of an exposure dose and a focus of a stepper exposure process.

54. (New) The method of claim 46, wherein determining at least one optical characteristic of said ARC layer comprises determining at least one of a reflectivity, an index of refraction, and an extinction coefficient of said ARC layer.